

D.N. 0145.00

We Claim:

1. A composition having antibacterial and antifungal properties comprising a chitosan salt and an essential oil.

5

2. A composition having antibacterial and antifungal properties comprising a chitosan salt and an essential oil in a synergistically effective amount.

10

3. A composition according to Claim 1 wherein said composition further comprises a surface-active agent.

4. A composition according to Claim 1, wherein said essential oil is selected from the group consisting of cinnamon, savory, red thyme, allspice, bay, birch, cloves, carvacrol, and hinokitiol and mixtures thereof.

15

5. A composition according to Claim 1 wherein said composition further comprises an additional antimicrobial ingredient.

20

6. A composition according to Claim 1 wherein said composition further comprises at least an optional ingredient selected from the group consisting of protective colloids, adhesives, binding agents, chelating agents, thickening agents, thixotropic agents, penetrating agents, stabilizing agents, sequestering agents, anti-foam agents, antioxidants, natural or synthetic seasonings and/or flavors, dyes and/or colorants, vitamins, minerals, nutrients, enzymes, insecticides, deodorants, and mixtures thereof.

25

D.N. 0145.00

7. A wipe impregnated with the antibacterial and antifungal composition according to Claim 1.

8. A composition according to Claim 1, packaged in a spray dispenser.

5

9. A packaging material impregnated with the composition of Claim 1.

10. A method for treating a surface of a food product wherein a composition according to Claim 1 is applied onto said surface.

11. A method for protecting food products from bacterial and fungal infection by contacting the surface of a fruit or vegetable with the composition according to Claim 1.

12. A method for protecting an exposed fresh fruit or an exposed fresh vegetable from postharvest and foodborne pathogens, the method comprising:

a) applying the composition of Claim 1 to the surface of a fresh fruit or fresh vegetable; and

b) obtaining a fresh fruit or fresh vegetable that is protected from postharvest and foodborne pathogens.

13. The method according to Claim 12 wherein said composition is directly applied to said food surface.

14. The method according to Claim 13 wherein said composition is directly applied to said food surface by means of being included in a marinade, breading, seasoning rub,

D.N. 0145.00

glaze or colorant mixture which is applied to said food surface.

15. The method according to Claim 12 wherein said composition is applied to food packaging material which is thereafter brought into contact with said food surface.

5

16. A method for inhibiting microbial growth or toxin production in foods contaminated with bacteria and fungi by contacting the surface of a fruit or vegetable with the composition according to Claim 1.

10

17. A method for reducing the overall bacterial and fungal content of a food product by applying to the surface of said product an effective amount of the composition of Claim 1.

15

18. The method according to Claim 17 wherein said food product is a fruit, vegetable, or edible nut.

20

19. A food product having reduced bacteria or fungi as a result of having applied thereon to its surface a composition which demonstrates efficacy against bacteria or fungi or both, comprising the composition of Claim 1.

20. An exposed fresh fruit or vegetable or a mixture of exposed fresh fruits and vegetables, comprising: cut pieces of fruit or vegetable; and a coating on the exposed surfaces of the fruit or vegetable, the coating comprising the composition of Claim 1.

25